

IN THE ABSTRACT

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[000119] An apparatus and method for inverting a 4x4 source matrix ~~are described~~. A source matrix is ~~initially~~ divided into four 2x2 sub-matrices. ~~Once sub-divided, a~~ plurality of sub-matrix products are subsequently calculated from the sub-matrices. Next, a determinant of the source matrix is calculated to form a determinant residue utilizing ~~one or more of the~~ previously computed sub-matrix products. Calculation of partial inverse for each sub-matrix is next performed, using ~~one or more of the~~ sub-matrix products and determinants of the sub-matrices. Finally, an inverse of each sub-matrix is calculated, utilizing the partial inverse sub-matrices and the determinant residue to form an inverse of the 4x4 source matrix. The method allows processors to store two floating-point elements within a Single Instruction Multiple Data (SIMD) register. Accordingly, a sub-matrix is represented using two SIMD registers, resulting in improved computational locality and efficiency ~~in comparison to the standard methods, thereby improving performance for matrix inversion operations~~. Other embodiments are described and claimed.